UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/01434

December 3, 2003

Mr. Lawrence C. Evans
U.S. Army Corps of Engineers
Attn: Mary Headley
Regulatory Branch, CENWP-OP-G
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Rhodia - Suttle Road Facility: Oregon Slough Site Remediation Sediment Cap, Multnomah County, Oregon (Corps No. 200300381)

Dear Mr. Evans:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) that addresses the proposed issuance of a permit for placement of a sediment cap in the Oregon Slough, a side channel of the Columbia River, adjacent to Rhodia's Suttle Road Facility in Multnomah County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize the continued existence of ESA-listed Snake River (SR) sockeye salmon (*Oncorhynchus nerka*), SR fall-run chinook salmon (*O. tshawytscha*), SR spring/summer-run chinook salmon, Upper Columbia River (UCR) spring-run chinook salmon, Lower Columbia River (LCR) chinook salmon, Columbia River chum salmon (*O. keta*), SR steelhead (*O. mykiss*), UCR steelhead, Middle Columbia River steelhead, and LCR steelhead. This Opinion includes reasonable and prudent measures with terms and conditions that are necessary to minimize the potential for incidental take associated with this action.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600. This reach of the Columbia River has been designated as EFH for chinook salmon, coho salmon (*O. kisutch*), and starry flounder (*Platyichthys stellatus*).

If you have any questions regarding this consultation, please contact Dr. Nancy Munn of my staff in the Oregon Habitat Branch at 503.231.6269.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Dan Bersanti, Rhodia
Bruce Gilles, Oregon Department of Environmental Quality
Brad Hermanson, Parametrix, Inc.
Kevin Halsey, Parametrix, Inc.

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Rhodia - Suttle Road Facility,
Oregon Slough Site Remediation Sediment Cap
Multnomah County, Oregon
(Corps No. 200300381)

Agency:	Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	December 3, 2003
Issued by:	for Michael R Course D. Robert Lohn Regional Administrator
Refer to:	**2003/01434**

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1. INTRODUCTION

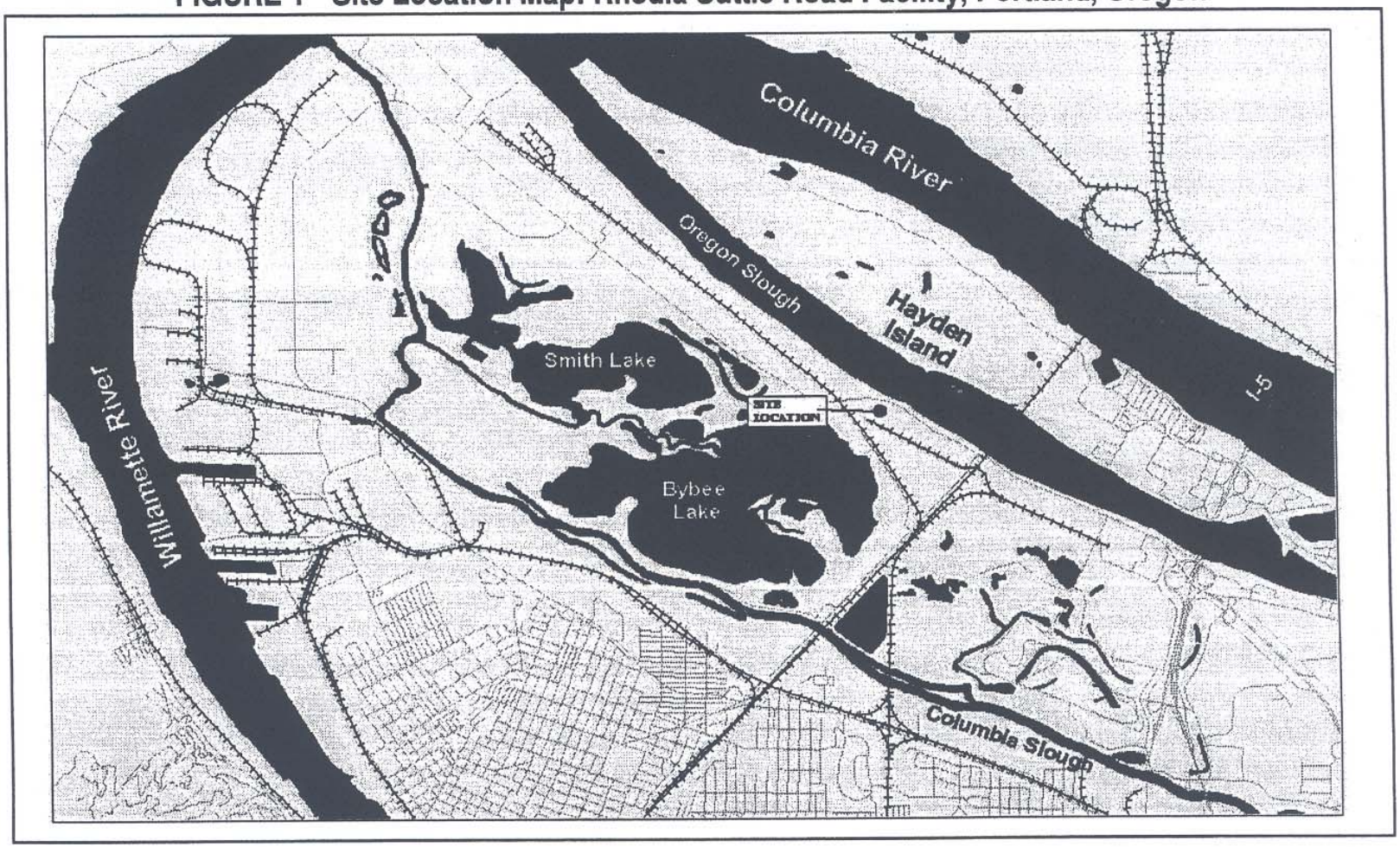
1.1 Consultation History

On November 24, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter dated November 20, 2003 and a biological assessment (BA) from the U.S. Army Corps of Engineers (COE) requesting formal consultation on the issuance of a permit to Rhodia, Inc., to place a sediment cap over contaminated sediments in the Oregon Slough beside Rhodia's Suttle Road Facility (Figure 1). The Oregon Slough is a side channel of the Columbia River upstream of the Port of Portland's Terminal 6. In the November 20, 2003, letter the COE determined that Snake River (SR) sockeye salmon (*Oncorhynchus nerka*), SR fall-run chinook salmon (*O. tshawytscha*), SR spring/summer-run chinook salmon, Upper Columbia River (UCR) spring-run chinook salmon, Lower Columbia River (LCR) chinook salmon, Columbia River chum salmon (*O. keta*), SR steelhead (*O. mykiss*), UCR steelhead, Middle Columbia River steelhead, and LCR steelhead may occur within the project area and that the proposed project is "likely to adversely affect" (LAA) the listed species. The project area has been designated critical habitat for SR fall-run chinook salmon, SR spring/summer -run chinook salmon, and SR sockeye salmon. References for listing status and dates, critical habitat designations, and ESA section 4(d) take prohibitions are provided in Table 1.

Rhodia's Suttle Road Facility discharged alum mud contaminated with chlorinated pesticides, including DDT, to the Oregon Slough during plant operations from 1954 to 1973. Between 1994 and 1998, Rhodia conducted a remedial investigation and feasibility study for the Suttle Road Facility as part of Oregon Department of Environmental Quality (DEQ) voluntary cleanup provisions. Removal of soils, placement of an asphalt cap, planting of poplar trees, and other remedial actions have occurred on the upland portion of the Suttle Road Facility site. Based on agreements reached with DEQ , Rhodia is proposing to install a geotextile and granular sediment cap over contaminated sediments of the river bed of the Oregon Slough. The Oregon Slough is a side channel of the Columbia River, formed by Tomahawk and Hayden Islands, just upriver from where the Willamette River joins the Columbia River. Installation of the sediment cap will require removal/fill authorization from the COE in the form of a Clean Water Act Section 404 Permit.

This biological opinion (Opinion) is based on the information presented in the BA, information received from the COE on November 17, 2003, and information provided during discussions with the COE, the applicants, and the project consulting firms Parametrix and CH2M Hill. The objective of this Opinion is to determine whether the placement of the sediment cap on the river bed of the Oregon Slough is likely to jeopardize the continued existence of the ESA-listed species described in Table 1 or adversely affect designated critical habitat. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

FIGURE 1 - Site Location Map: Rhodia Suttle Road Facility, Portland, Oregon



The objective of the EFH consultation is to determine whether the proposed action may adversely affect designated EFH for coho salmon (*O. kisutch*), chinook salmon, and starry flounder *(Platichthys stellatus)*, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

Table 1. References for Additional Background on Listing Status, Biological Information, Protective Regulations, and Critical Habitat Elements for the ESA-Listed Species Considered in this Consultation.

Species ESU	Status	Protective Regulations	Critical Habitat	Biological Information, Historical Population Trends
Chinook salmon (*O. tshawytscha*)				
Lower Columbia River	T 3/24/99; 64 FR 14308	7/10/00; 65 FR 42422		Myers *et al.*1998; Healey 1991
Upper Columbia River spring-run	E 3/24/99; 64 FR 14308	7/10/00; 65 FR 42422		Myers *et al.*1998; Healey 1991
Snake River spring/summer-run	T 4/22/92; 57 FR 14653	4/22/92; 57 FR 14653	10/25/99; 57 FR 14653 and 57 FR 23458	Matthews and Waples 1991; Healey 1991
Snake River fall-run	T 4/22/92; 57 FR 14653	4/22/92; 57 FR 14653	12/28/93; 58 FR 68543	Waples *et al.* 1991b; Healey 1991
Steelhead (*O. mykiss*)				
Lower Columbia River	T 3/19/98; 63 FR 13347	7/10/00; 65 FR 42422		Busby *et al.* 1995; 1996
Middle Columbia River	T 3/25/99; 64 FR 14517	7/10/00; 65 FR 42422		Busby *et al.* 1995; 1996
Upper Columbia River	E 8/18/97; 62 FR 43937	7/10/00; 65 FR 42422		Busby *et al.* 1995; 1996
Snake River Basin	T 8/18/97; 62 FR 43937	7/10/00; 65 FR 42422		Busby *et al.* 1995; 1996
Chum salmon (*O. keta*)				
Columbia River	T 3/25/99; 64 FR 14508	7/10/00; 65 FR 42422		Johnson *et al.* 1997; Salo 1991
Sockeye salmon (*O. nerka*)				
Snake River	E 11/20/91; 56 FR 58619	11/20/91; 56 FR 58619	12/28/93; 58 FR 68543	Waples *et al.* 1991a; Burgner 1991

1.2 Proposed Action

Project Location

The proposed action is within the Oregon Slough, a side channel of the Columbia River in the North Portland Harbor. The Oregon Slough flows along the south side of Hayden Island and the main channel of the Columbia River flows along the north side of Hayden Island. The proposed sediment cap would be installed along the southern shore at approximately river mile 2.5 of the Oregon Slough, which corresponds to river mile 105.1 of the Columbia River. The Oregon Slough in the vicinity of the project is approximately 1,000 feet wide.

Project History

Stauffer Chemical Company established the Suttle Road Facility in 1941 to produce aluminum sulfate (alum) for use in water purification. Agricultural chemicals were also formulated at the site from 1954 to 1985. The site was purchased by Rhône-Poulenc in 1987 resulting in a change in the alum production process. Rhodia took ownership in 1997 with no change in operations. The production facility sits on eight acres of the 26.8-acre Rhodia site. The remaining land is undeveloped and was not affected by the historical release of chemicals.

The former alum production process used bauxite and produced approximately 300 pounds of alum mud for every ton of bauxite. The facility generated roughly 2,000 tons of waste alum mud annually. From 1941 until 1968, process wastewater mixed with alum mud was discharged directly to the Oregon Slough through an 8-inch pipe. This practice was discontinued in 1968 following the construction of a polyethylene-lined pond. The pond is used to settle alum mud from the process water. The water is recycled back into the alum production process, and the dried mud is transported to an off-site solid waste landfill.

From 1954 to 1985, Stauffer Chemical formulated agricultural pesticides and herbicides at the facility. The company produced a wide variety of products that were often custom blended and applied to carriers such as talc and clay. The carriers were ground using ball mills, and the liquid pesticides were applied to the carriers. As a result of the dual use of the grinding equipment for both the alum production and pesticide formulations, the pesticides were introduced into the alum mud that was discharged to the river from 1954 to 1968.

Investigations at the facility have been conducted periodically over the last 20 years. In 1982, DEQ collected sediment samples next to the plant. Low levels, but elevated in comparison to surface sediment concentrations, of the pesticide DDT were detected in surface sediment samples. In 1983, DEQ concluded that no removal action was required for the alum deposits due to the lack of mobility of the pesticide compounds, but DEQ remained concerned with the potential toxicity to aquatic organisms.

The U.S. Environmental Protection Agency (EPA) conducted additional investigations of the facility in 1984 and 1989. Groundwater, alum and sediment samples were tested for pesticides, metals and other organic compounds. The 1989 investigation did not detect pesticides in surface sediment samples collected adjacent to the plant. EPA chose not to proceed with any

action under the Federal Superfund Program, and referred the site back to the state for further evaluation.

In the early 1990s, the City of Portland (City) conducted an environmental investigation within the proposed roadway alignment for the North Marine Drive extension project across the property. Significant levels of chlorinated insecticides and arsenic were detected in soil and groundwater beneath the proposed road alignment. An agreement between DEQ and the City allowed construction of the road extension over the underlying material. A geotextile liner was placed on the material before construction of the road, and institutional controls were used to restrict removal of the road and access to the underlying material.

Between 1994 and 1998, Rhodia conducted a remedial investigation and feasibility study for the site. DEQ selected the remedial action for the site as described in the Record of Decision (ROD) dated September 17, 1999. The remedial action consisted of the following elements:

- Removal of up to 300 tons or 200 cubic yards of hot spot soil for off-site treatment and disposal.
- Placement of an asphalt cap over areas of soil contamination exceeding the risk-based cleanup levels specified in the ROD.
- Planting of poplar trees between the Oregon Slough and North Marine Drive along the northern property boundary to reduce the discharge of shallow groundwater to the Oregon Slough.
- Placement of deed restrictions limiting subsurface excavation or groundwater use in areas of the facility identified in the ROD which contain residual soil contamination exceeding risk-based cleanup levels specified in the ROD.
- Maintenance of asphalt and existing building foundations to ensure the effectiveness of these physical structures in preventing worker contact with contaminated soil.
- Continued monitoring of groundwater, surface water and sediment.
- Contingencies to evaluate further hot spot removal in the event of redevelopment of the facility.

Removal of the hot spot soils, capping of the remaining contaminated soils at the plant, tree planting, and filing of deed restrictions were completed in accordance with the ROD. Monitoring of groundwater, surface water and sediments began in the fall of 1999. The 1999 monitoring results for surface water and sediment exceeded the cleanup criteria specified in the ROD. DEQ required Rhodia to conduct additional monitoring to verify the results. Monitoring completed in 2000 verified the sediment exceedances. Surface water monitoring results did not show pesticide concentrations exceeding ambient water quality criteria. Surface water monitoring results in 2001 also did not show pesticide concentrations above the criteria. The exceedance of the ambient water quality criteria in 1999 may have been due to suspended sediments in the surface water samples.

The confirmed pesticide concentrations in surface sediments beside the Rhodia facility warrant further remedial action to ensure protection of human health and the environment. Additional

investigations were conducted in 2001 to develop new remedial activities as required by the ROD. The proposed sediment cap was developed as the preferred remedial action.

Proposed Construction Activities

Based on agreements reached with DEQ through the voluntary cleanup provisions, Rhodia is proposing to place a granular sediment cap over the contaminated sediment in the Oregon Slough (Figure 2). The purpose of the cap is to contain and prevent suspension of contaminated sediments, and to isolate the sediments by preventing a direct exposure pathway to benthic organisms.

The design of the 46,300 square foot cap will include a geotextile layer covered by three to six inches of gravel and twelve to eighteen of class 25 rocks (or similar) to control future erosion of the cap material from wind or water-induced wave action or flood events. The geotextile fabric will help support the capping materials, prevent suspension of sediments during gravel and rock placement, and provide a filter between the fine-grained sediment and the coarser capping material.

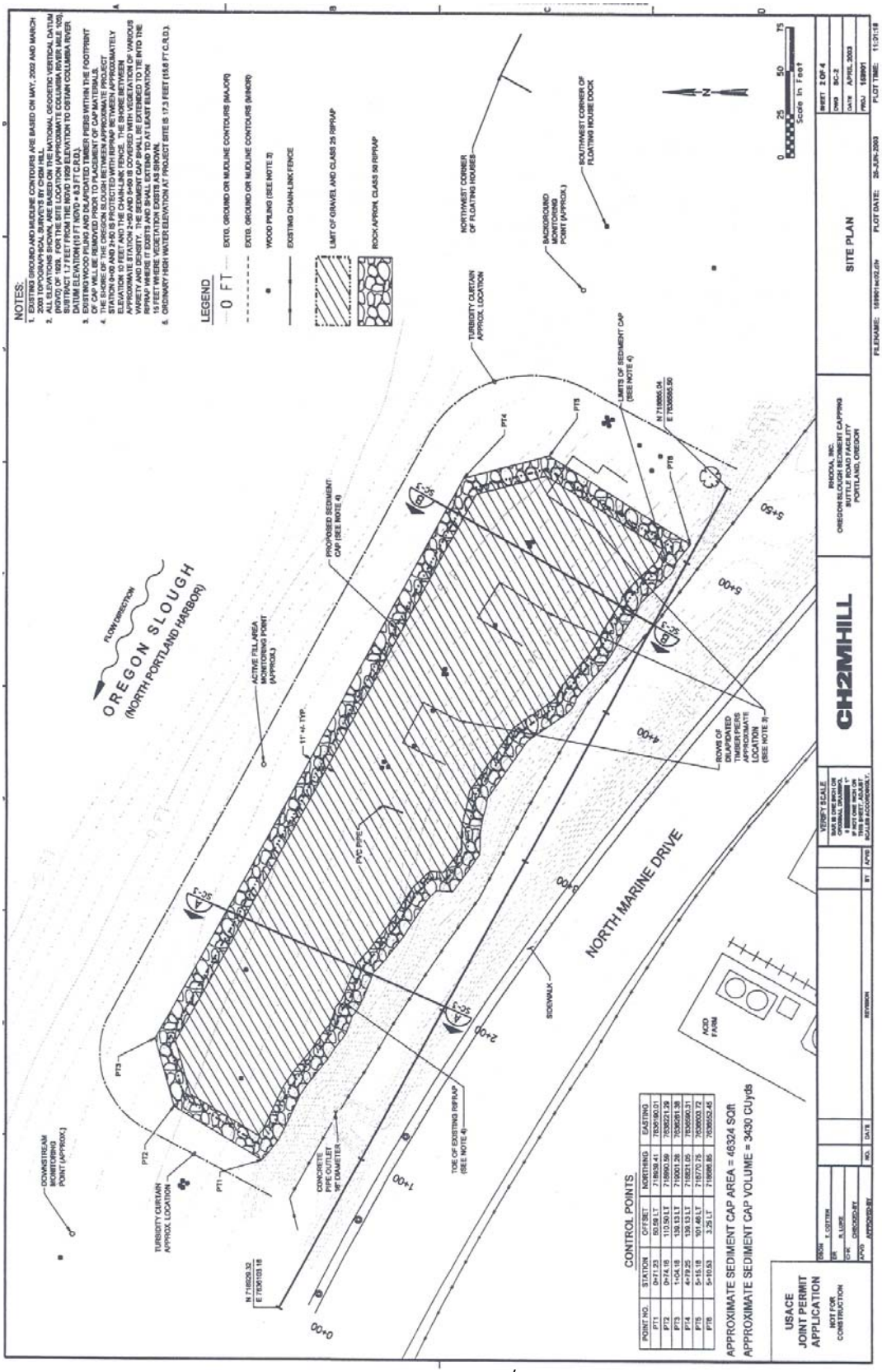
The construction process will consist of the following steps:

1. A pre-construction survey including turbidity monitoring to establish a before-project baseline.
2. Clearing of debris in the cap area, and then placement of a geotextile fabric.
3. Construction of a riprap berm around the cap area to contain the cap material and minimize sediment transport offsite.
4. Placement of cap materials from a barge anchored in the slough.
5. Placement of anchored marker buoys around the cap to warn passing watercraft of shallow rocks.

The placement of the geotextile fabric, gravel and rock will be monitored from the surface and by divers. Turbidity levels will also be monitored during cap construction.

The source of the gravel and rock will be natural crushed rock material that is reasonably well-graded, with a low percentage of fines. The rock will be comprised of Class 25 riprap, that ranges from approximately two to eight inches in diameter. The gravel will be obtained from one or more of the rock quarries or gravel pits in the general vicinity of Portland or Vancouver, Washington.

Figure 2. Proposed Sediment Cap Design.



A temporary uplands staging area will be identified along North Marine Drive. An existing parking lot along North Marine Drive may be used for contractor vehicle parking. Temporary staging of fill materials will likely occur on a supply barge that will be used to bring materials from a dock facility to the site. It is expected that one or more supply barges would be anchored outside of the cap footprint, but inside a proposed turbidity curtain.

Proposed Mitigation and Best Management Practices

Before beginning construction of the sediment cap, existing timber pilings and portions of former timber pile docks within the proposed cap footprint will be removed. All pilings and dock components, which extend about one to two feet above the sediment-water interface, will be cut at the interface. The applicant will likely use a barge-mounted hydraulic cutting device that is capable of shearing large-diameter timbers below the water surface. If that technique does not work, it is likely that divers will cut the pilings with barge-mounted hoists available to extract the cut portions. The number of pilings to be removed in the project area is estimated at 200. If the pilings have been treated with creosote, the top exposed portion of each piling will be covered with a layer of sand immediately to prevent release of freshly-exposed creosote into the water column.

The work is proposed for the Columbia River in-water work period of November 1 to February 28 when river levels are typically high. Based on tidal data and typical releases from up-river dams, it is expected that the majority of the site will be below the water surface.

A stormwater outlet empties into the project area. The stormwater outlet drains a catch basin along North Marine Drive. If stormwater from this pipe becomes a concern during the sediment cap construction, flow will be collected at the outfall and directed around the project area.

Increased turbidity as a result of construction is a concern. The geotextile should reduce re-suspension of sediment. To avoid damage to the geotextile and disturbance of the underlying sediment, the bucket will be lowered as close to the geotextile as practical before the release of gravel. The following steps will also be used to reduce the suspension of sediments:

- Silt/turbidity curtains will be installed before any in-water work, and will remain in place until all cap construction activities are completed. Fish salvage will be conducted to remove fish trapped within the silt curtain enclosure.
- The turbidity curtain will surround all in-water work.
- To maximize the effectiveness of the curtain, the depth of the curtain will match the depth of the water to the extent possible. This may necessitate the use of curtains of varying depths.
- The turbidity curtain will be inspected at least once daily during construction to ensure continued proper placement and to ensure that no damage to the curtains has occurred.
- The turbidity curtains will be removed after the completion of all in-water work that has the potential to suspend sediments. The process for removal of the turbidity curtains will be addressed in the Pollution and Erosion Control Plan, and will be done with care

to maximize the capture of sediment contained by the silt curtains and minimize the loss of captured sediments.

- A turbidity monitoring plan will be developed and implemented. The plan will specify the frequency of monitoring during in-water work. A calibrated turbidimeter will be used to obtain all measurements; if the turbidimeter malfunctions, then visual observations will be performed. Turbidity monitoring data will be recorded in a logbook and maintained at the construction site. At a minimum, two sets of turbidity readings will be obtained daily during active construction: one set at approximately mid-day, and one set at the end of the day just after operations have ceased.
- Construction activities will be sequenced to minimize the potential for turbidity increases. For example, any work that can be completed in the dry will be done first. The geotextile layer will be installed as soon as possible, and the gravel and rock will be required to have a low percentage of fines. Placement of gravel and rock will be done with a barge-mounted clamshell bucket or equivalent.

Following cap construction, a long-term monitoring program will be completed. Initially, yearly cap inspections will be required, then inspection intervals will be lengthened to five years. Maintenance of any damaged areas would occur immediately following the inspection. Regular reports will be sent to DEQ. Institutional controls will be used to prevent damage to the cap such as deed and property restrictions, physical barriers to recreational boaters, signage and monitoring requirements.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The Columbia River and Oregon Slough serve as migration areas for all listed species under consideration in this Opinion. The action area may also serve as a feeding and rearing area for juvenile chum and sub-yearling chinook salmon. Essential features of the area for the species are: (1) Substrate; (2) water quality; (3) water quantity; (4) water temperature; (5) water velocity; (6) cover/shelter; (7) food (juvenile only); (8) riparian vegetation; (9) space; and (10) safe passage conditions (50 CFR 226). The proposed action within the action area serves as a rearing and migration area for listed species considered in this Opinion. The essential habitat features that the proposed project may affect are substrate, water quality, cover/shelter and food (juvenile).

References for further background on listing status, biological information and critical habitat can be found in Table1. According to a recent draft of "Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead," drafted by the West Coast Salmon Biological Review Team (BRT), a number of ESUs were determined by the majority of the BRT "likely to become endangered in the foreseeable future" including LCR chinook and

LCR steelhead (NOAA Fisheries 2003). Preliminary conclusions for each listed ESU considered in this Opinion are discussed below.

Lower Columbia River Chinook

The abundance of natural origin spawners range from completely extirpated for most of the spring run populations to over 6,500 for the Lewis River bright population. The majority of the fall run tule populations have a substantial fraction of hatchery origin spawners in the spawning areas and are hypothesized to be sustained largely by hatchery production. Exceptions are the Coweeman and Sandy River fall run populations which have few hatchery fish spawning on the natural spawning areas. These populations have recent mean abundance estimates of 348 and 183 spawners, respectively. The majority of the spring run populations have been extirpated largely as the result of dams blocking access to their high elevation habitat. The two bright chinook populations, *i.e.*, Lewis and Sandy, have relatively high abundances, particularly the Lewis.

Threats to chinook spawning and rearing habitat in the Lower Columbia River ESU continue to be habitat degradation and loss due to extensive hydropower development projects, urbanization, logging and agriculture.

Upper Columbia River Spring-run Chinook

There are no estimates of historical abundance for this ESU before the 1930s. The drainages supporting this ESU are all above Rock Island Dam on the upper Columbia River, which began operations in 1933 and is the oldest major hydroelectric project on the Columbia River. Spring chinook salmon currently spawn in three major drainages above Rock Island Dam–Wenatchee, Methow and Entiat Rivers. They may have used portions of the Okanogan River. Grand Coulee Dam, completed in 1938, and then Chief Joseph Dam constructed downstream from Grand Coulee Dam both block anadromous fish. Artificial production efforts date back to the 1890s.

In 1998, the BRT noted that populations within this ESU had declined to critically small sizes. Some populations consisted of less than 100 fish (Myers *et al.* 1998). Habitat degradation, blockages and hydrosystem passage mortality all contributed to the significant declines. This ESU was listed as endangered in 1999 (64 FR 14308). Since then, many populations have rebounded somewhat from the critically low levels (NOAA Fisheries 2003). Although this is encouraging, the last year or two of higher returns come after a decade or more of steep declines to all-time record low escapements. In addition, this ESU continues to be largely influenced by hatchery production.

Snake River Spring/Summer-run Chinook

This ESU is defined as the spring and summer chinook salmon runs returning to the major tributaries of the Snake River (Matthews and Waples 1991). Production areas are characterized by spring-timed returns, summer-timed returns, and combinations from the two adult timing patterns. In general, spring type chinook tend to spawn in higher elevation reaches of major Snake River tributaries in mid through late August, and summer run fish spawn approximately

one month later. Many of the tributaries used by the ESU exhibit two major features: extensive meanders through high elevation meadowlands and relatively steep lower sections joining the drainages to the mainstem Snake (Matthews and Waples 1991). Historically, the Salmon River system may have supported more than 40% of the total return of spring and summer chinook to the Columbia system (Fulton 1968).

The 1991 ESA status review of the Snake River spring/summer chinook ESU concluded that the ESU was at risk because abundance had dropped to a small fraction of historical levels (Matthews and Waples 1991). Risk modeling indicated that if the historical trend in abundance continued, the ESU as a whole was a risk of extinction within 100 years, and that risks to individual subpopulations may be even greater. Continued disruption due to the impact of mainstem hydroelectric development including altered flow regimes, impacts to estuarine and freshwater habitats, and hatchery stocks support a continued trend in abundance. Like many others, this ESU saw a large increase in escapement in many populations in 2001 (NOAA Fisheries 2003). However, recent abundance is still short of the levels that the proposed recovery plan for Snake River salmon indicated should be met over at least an eight year period (NMFS 1995). The critical habitat designation remains in place and includes migratory habitat in the proposed action area.

Snake River Fall-run Chinook

Snake River fall chinook spawn above Lower Granite Dam in the mainstem Snake River and in the lower reaches of major tributaries entering below Hells Canyon Dam. Adult fall chinook enter the Columbia River in July and August. The Snake River fall component of the fall chinook run migrates past the Lower Snake River mainstem dams in September and October, and spawning occurs through November. Subyearling migrants move downstream from natal spawning and early rearing areas from June through early fall.

Fall chinook returns to the Snake River generally declined through the first half of this century (Irving and Bjornn 1981). In spite of the declines, the Snake River basin remained the largest single natural production area for fall chinook in the Columbia drainage into the early 1960s (Fulton 1968). Spawning and rearing habitat was significantly reduced by the construction of the mainstem dams, and limited the availability of natural spawning areas. The first chinook status reviews (Myers *et al.* 1998, Waples *et al.* 1991) identified these causes for the decline of this ESU: (1) Steady and severe decline in abundance since the early 1970s; (2) loss of the primary and spawning and rearing areas upstream of the Hells Canyon Dam complex; (3) increase in non-local hatchery contribution; and (4) relatively high aggregate harvest impacts in ocean and in-river fisheries. The more recent BRT report was more optimistic, although the number of naturally produced spawners is still very low (NOAA Fisheries 2003). Also, because of the large fraction of naturally spawning hatchery fish, it is difficult to assess the productivity of the natural population. The critical habitat designation remains in place and includes migratory habitat in the proposed action area.

Lower Columbia River Steelhead

Based on the updated information provided in the BRT report (NOAA Fisheries 2003), the information contained in previous LCR status reviews, and preliminary analyses, the number of historical and currently viable populations have been tentatively identified. Like the previous BRT, the current BRT could not conclusively identify a single population that is naturally self-sustaining. Over the period of the available time series, most of the populations are in decline and are at relatively low abundance. No population has a recent mean greater than 750 spawners. In addition, many of the populations continue to have a substantial fraction of hatchery origin spawners.

Middle Columbia River Steelhead

The major drainages in the MCR steelhead ESU are the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima river systems. NOAA Fisheries (2003) has indicated that the five-year average (geometric mean) abundance of natural MCR steelhead in 2002 was up from previous years' basin estimates in the ESU. The Klickitat, Yakima, Touchet, and Umatilla systems are all well below their interim abundance targets. The John Day and Deschutes are at or above their interim targets for abundance, however straying of fish into the Deschutes system from other ESUs is significant concern (Table 2). The productivity estimate of the MCR ESU is approximately 0.98, slightly below its target of 1.0. The BRT has determined that the MCR ESU is likely to become endangered because of stock abundance and long-term productivity being depressed within the ESU.

Table 2. Interim Abundance Targets for the MCR Steelhead ESU (adapted from NOAA Fisheries 2003).

ESU/Spawning Aggregations*	Interim Abundance Targets	Interim Productivity Objective
Walla-Walla	2,600	Middle Columbia ESU populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0
Umatilla	2,300	
Deschutes (Below Pelton Dam Complex)	6,300	
John Day		
North Fork	2,700	
Middle Fork	1,300	
South Fork	600	
Lower John Day	3,200	
Upper John Day	2,000	

Upper Columbia River Steelhead

Life history patterns of the upper Columbia River steelhead are complex. Adults return to the Columbia River in late summer and early fall. Most migrate relatively quickly up the mainstem to the tributaries. A portion of the returning run overwinters in the mainstem reservoirs, passing over the upper mid-Columbia dams in April and May of the following year. Spawning occurs in late spring, and juveniles spend one to seven year in freshwater. Smolt outmigrants are predominantly age two and age three juveniles.

Harvest rates on upper river steelhead have been cut back substantially from historical levels (NOAA Fisheries 2003). Direct commercial harvest of steelhead in non-Indian fisheries was eliminated in the early 1970s. In the 1970s and early 1980s, recreational fishery impacts in the upper Columbia escalated to very high levels in response to increasing returns augmented by substantial increases in hatchery production.

Estimates of annual return are based on dam counts. Hatchery returns predominate the estimated escapement in the Wenatchee, Methow and Okanogan River drainages. The spawn timing is accelerated for the hatchery run. The long-term effects of this is not known. The 1998 status review notes that the populations have been relatively stable or increasing, it appears to be occurring only because of major hatchery supplementation. The major concern for this ESU is the clear failure of natural stocks to replace themselves. The BRT members were concerned about genetic homogenization, apparent high harvest rates on steelhead smolts in rainbow trout fisheries, and degradation of freshwater habitats, especially the effects of grazing , irrigation diversions and hydroelectric dams. This ESU was listed as endangered in 1997.

While the last two to three years have seen an encouraging increase in the number of naturally produced fish in this ESU (NOAA Fisheries 2003), the recent mean abundance is the major basins is still only a fraction of the interim recovery targets (NMFS 2002). Furthermore, overall adult returns are still dominated by hatchery fish and detailed information is lacking regarding productivity of natural populations. No data suggest that the extremely low replacement rates of naturally spawning fish have improved.

Snake River Basin Steelhead

The Snake River steelhead ESU is distributed throughout the Snake River drainage system, including tributaries in southwest Washington, eastern Oregon and north/central Idaho (NMFS 1996). Snake River steelhead occupy habitat that is considerably warmer and drier than other steelhead ESUs. They are generally classified as summer run based on their adult run timing pattern. They enter the Columbia River from late June to October, hold over the winter and spawn during the following spring (March to May). With one exception (the Tucannon River production area), the tributary habitat used by Snake River steelhead is above Lower Granite Dam. Although direct historical estimates of production from the Snake basin are not available, the basin is believed to have supported more than half of the total steelhead production from the Columbia Basin (Mallet 1974).

The primary concern for this ESU identified in the 1998 status review was a sharp decline in natural stock returns beginning in the mid-1980s. The high proportion of hatchery fish in the run was also identified as a concern, particularly because of the lack of information on the actual contribution of hatchery fish to natural spawning. Other concerns listed were widespread habitat degradation, flow impairment throughout the Snake basin, and substantial modification of the migration corridor by hydroelectric power development.

In spite of recent increases in the abundance of some populations (NOAA Fisheries 2003), the abundance in most populations for which there are adequate data are well below interim recovery targets (NMFS 2002). The interaction of resident and migratory steelhead in this ESU is not well understood.

Columbia River Chum Salmon

Chum salmon are semelparous, spawning primarily in freshwater but spend more of their life in marine waters that any other Pacific salmonids. The species has the widest natural geographic and spawning distribution of any Pacific salmonid, primarily because its range extends further along the shores of the Arctic Ocean than other salmonids. Chum salmon may historically have been the most abundant of all salmonids. Neave (1961) estimated that prior to the 1940s, chum salmon contributed almost 50% of the total biomass of all salmonids in the Pacific Ocean.

In December 1997, the first status review of west coast chum salmon (Johnson et al. 1997) noted dramatic declines in the abundance of this ESU as well as significant restrictions in the distribution. The BRT was also concerned about the low productivity of the extant population. The updated status review states that close to 90% of the historic populations in the ESU are extinct or nearly so, resulting in loss of much diversity and connectivity between populations (NOAA Fisheries 2003). The populations that remain are small and overall abundance for the ESU is low. Unofficial reports for 2002 suggest a large increase in abundance in some locations (NOAA Fisheries 2003). The cause of this increase is not known, and the sustainability of the increase is not known.

Snake River Sockeye Salmon

Sockeye salmon exhibit a wide variety of life history patterns that reflect varying dependency on the fresh water environment. With the exception of certain river-type and sea-type populations, the vast majority of sockeye salmon spawn in or near lakes, where the juveniles rear for one to three years prior to migrating to the ocean. The Snake River sockeye salmon, which spawns in Redfish Lake, Idaho, spawns at a higher elevation (2,000 m) and has a longer freshwater migration (1,500 km) than any other sockeye salmon population in the world (Waples *et al.* 1991a). In the fall of 1990, no adults were observed at Lower Granite Dam or entering the lake, and only one fish was observed in each of the two previous years. However, a population of kokanee also existed in Redfish lake, and the relationship between sockeye and kokanee was not well understood. Sunbeam Dam, 20 miles downstream of Redfish Lake, is a serious impediment to anadromous fish. The first status review in 1991 did not have adequate information on fish passage at the dam or the interaction of the sockeye and kokanee populations to understand the status of the species. Consequently, the BRT used the

precautionary principle and recommended listed of the ESU as endangered (56 FR 58619). The status of the natural population remains extremely precarious, and only 16 naturally produced adults have returned since the listing in 1991, and all have been taken into the captive breeding program (NOAA Fisheries 2003). The critical habitat designation remains in place and includes migratory habitat in the proposed action area.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy and destruction or adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations combined with the Habitat Approach (NMFS 1999): (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species and whether the action is consistent with the available recovery strategy; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors is likely to appreciably reduce the likelihood of species survival in the wild or destroy or adversely modify critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration and rearing. Listed Pacific salmonid survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on

allowing natural processes to increase their ecological function, while removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a "habitat approach" to its analysis (NMFS 1999). The current status of the listed species covered by this Opinion, based upon their risk of extinction, has not significantly improved since they were considered for listing.

2.1.4 Environmental Baseline

In step 2 of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area to the species' current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined by NOAA Fisheries regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area for this project, therefore, includes the streambed of the Oregon Slough, from 100 feet upstream of the cap boundary, downstream to the extent of visible turbidity resulting from construction activities, 300 feet downstream of the cap boundary.

The Oregon Slough flows along the south side of Hayden Island and the main channel of the Columbia River flows along the north side of Hayden Island. The proposed sediment cap would be installed along the southern shore at approximately river mile (RM) 2.5 of the Oregon Slough, which corresponds to RM 105.1 of the Columbia River. Water from the Columbia River enters the Oregon Slough at approximate RM 108.5 and flows downstream past the project site, returning to the Columbia River at RM 102.5. The Oregon Slough is approximately 6 river miles in length and, in the vicinity of the project, is approximately 1,000 feet wide. The Oregon Slough and the Columbia River are separated by Hayden Island and Tomahawk Island.

Marine Drive was constructed in the 1990s along a man-made dike on the southern edge of the Oregon Slough. Upstream of the Rhodia site, an outfall from the City of Portland's Columbia Boulevard Wastewater Treatment Plant discharges into the Oregon Slough. Partially treated wastewater is discharged during extreme plant overflow events. Current and future beneficial uses of the surface water of the Oregon Slough include river navigation, recreation, fisheries, and fish passage.

The Rhodia facility is approximately 250 feet from the south shore of the Oregon Slough. North Marine Drvie borders the Rhodia facility to the north, isolating the shoreline owned by Rhodia from the rest of the property. The surface elevation of North Marine Drive is approximately five to 25 feet higher than the facility.

The contaminated sediment area is beside the Rhodia plant site, north of North Marine Drive and slightly west and downstream of a floating home community. The project area is a flat beach at the base of the riprap supporting North Marine Drive. The contaminated area extends

430 feet along the shoreline, and approximately 80 feet out into Oregon Slough. Property between Rhodia and the floating homes to the east of the site is occupied by XTRA, a commercial trucking company with paved truck parking. West of the site is a vacant lot owned by the Port of Portland. Land around the site is zoned industrial.

Water quality in the project area does not meet properly functioning conditions. Water temperatures can exceed 64°F, potentially impairing salmon rearing and migration and disrupting foraging. The mainstem Columbia River is listed for temperature exceedances on the Clean Water Act (CWA) 303(d) list of water quality limited streams. Turbidity levels or suspended sediment concentrations in the Oregon Slough are likely low compared to historic levels. The mainstem dams have reduced the average annual suspended sediment load from the historical level of 12 million cubic yards down to 2 million cubic yards. However, stormwater generated from impervious surface is a known source of sediment. Given the significant develop in the Lower Columbia River basin, stormwater contributions to suspended sediment in the Columbia River may have a profound effect on water quality. It is unlikely, though, that stormwater-generated turbidity approach the levels of suspended sediments in the river before dam construction.

The Columbia River in the project vicinity is on the CWA 303(d) list of water quality limited streams for arsenic, DDT, PAHs and PCB. The project site is contaminated with chlorinated pesticides, including DDT and its breakdown products DDE and DDD. Additional investigations to determine the distribution of DDT, DDE and DDD concentrations in surface sediments were completed in 2001. DDT and DDD were detected above the ROD cleanup criteria for more than half of the samples, with the highest concentrations found along the shoreline where native sediments overlying the alum are relatively thin. The area of sediment contamination exceeding the 7 ppb cleanup criteria is approximately one acre. Both DDT and DDD bioaccumulate through the food chain, and have been found in fish within the Columbia River at levels exceeding acceptable levels for human consumption.

The existing substrate at the project site is a sandy silt. The alum deposits are white to gray fine-grained material. Along the beach, the alum material is relatively shallow in a limited area near the outfall pipe. In this area, the alum material is covered by several inches of native sands. The thickness of the alum is up to 12 to 14 feet. Away from the beach, the depth of the alum declines, and they are overlain with a thicker layer of silty sediments.

Because of development along both banks of the Oregon Slough and consequently minimal riparian vegetation, little to no recruitment of large wood occurs in the slough. Large wood from upstream may occasionally enter the slough but this is discouraged because of the potential for damage to the houseboats and businesses along the banks of the slough.

Channel conditions and floodplain connectivity within the Oregon Slough have been altered by near-shore development, navigation channel dredging, and up-river dam construction. Dike construction, and dredge spoil deposition have severely constrained channel migration in the

slough. Much of the river bank of the Oregon Slough is lined with riprap to support the dike and North Marine Drive.

Based on this information as well as information in the BA, the environmental baseline within the action area is not properly functioning and is not currently adequate to meet the needs of migrating or rearing salmonids.

2.1.5 Effects of Proposed Action

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of the proposed action on listed fish and their habitat. Potential direct effects of the proposed action on listed salmonids includes the potential for direct take, harm or disturbance during in-water work, and modification of the shallow water habitat. Potential indirect effects include an increase in turbidity and a change in prey availability and foraging.

Short-term Effects of Construction

Salmonids use the Oregon Slough in the project vicinity differently depending upon the age at which they migrate downstream. Sub-yearlings tend to rear in near-shore habitats as they move downstream; whereas yearlings tend to preferentially use mid-channel habitat as a migratory corridor. Adult and yearling salmonids are less likely to use the near-shore habitat where construction will occur, and will likely flee the area when the area is disturbed. Sub-yearling salmonids typically favor the near-shore environment that will be disturbed, and are more limited in their ability to avoid the initial onset of construction activities. Additionally, the proposed action would occur during December, January, and February, when the probability of adults and yearlings being present in the project area is low. Consequently sub-yearling salmonids would be the most vulnerable to direct take during proposed project activities because they are present during the winter in-water work period, and because they tend to use shallow water habitats preferentially.

Fish rescue and salvage activities will remove fish from within the sediment curtains before placement of the sediment cap. Any listed fish removed from the isolated work area will experience high stress with the possibility of up to a 5% direct or delayed mortality rate depending on rescue method. Appropriate NOAA Fisheries-approved fish handling methods will minimize adverse effects to any fish removed during the project.

Any juvenile fish that are not salvaged from the project area may be disturbed or harmed by the proposed in-water work. Under this scenario, the potential for mortality during the placement of the sediment cap for any fish trapped within the sediment curtain is high. However, because the site has a depauperate benthic community and opportunities for feeding at the site are minimal, the number of salmonids at or near the worksite is expected to be low. Consequently, the likelihood of fish being injured or killed is low.

Suspension of sediment during the in-water work will disrupt or disturb listed salmonids. Sediment curtains and other best management practices will minimize the turbidity, but some

turbidity increase is unavoidable. Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987).

In the Oregon Slough, the placement of gravel and rock may have short-term adverse effects on adult and juvenile salmonids because of increased turbidity. However, use of sediment control measures described in section 1.2 above are expected to minimize transport of sediment and minimize the area of increased turbidity.

Long-term Effects of the Proposed Action

The proposed action will alter the character of the substrate in the project area. The river substrate in the project area is sand and silt. After construction, the substrate within the 1.06-acre cap will be two to eight-inch diameter rock. Salmonid prey species that use near-shore sandy habitat will not thrive at the site post-construction. This will lead to a net decrease in prey availability unless new prey species can colonize the project area.

Sub-yearling salmonids are commonly found within feet of the shoreline at water depths of less than three feet. Although they migrate between areas over deeper water, they generally remain close to the water surface and near the shoreline during rearing, favoring water no more than six feet deep and areas where the current does not exceed one foot per second. The proposed project will decrease the amount of shoreline and shallow water habitat by approximately 550 linear feet. The total area covered by the cap and thus the area of habitat modification is approximately 1.06 acres. The sediment cap will change the bathymetry of the Oregon Slough within the project area. Such changes may force sub-yearling salmonids into deeper water habitats where they may be subject to increased predation and less desirable foraging conditions.

However, the availability of prey species at the site currently is limited, presumably because of pesticide contamination. While the nature of the substrate will change, there is potential for an increase in benthic productivity because the isolation of the chemical contamination will provide a net benefit to benthic species using the project area.

2.1.6 Effects to Critical Habitat

As stated above in section 2.1.5, the shallow water habitat will be permanently altered by the placement of the sediment cap. The cap will alter the size fraction of the substrate and change the bathymetry of the river bottom. These changes will be offset by the removal of 20-180 pilings and the isolation of the chemical contamination. The cap will improve water quality in both the project area and areas downstream of the site. The change in character of 1.06 acres of

the river bed of the Oregon Slough will not appreciably diminish the value of critical habitat for both the survival and recovery of the listed species.

2.1.7 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." This is step 4 in NOAA Fisheries' analysis process. Future federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action.

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater impacts to listed species than presently occurs. However, industrial activities in the project vicinity will continue, and this will likely involve redevelopment of existing facilities, expansion of existing facilities, and new industrial development. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years**.**

2.1.8 Conclusion

The final step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action is likely to appreciably reduce the likelihood of species survival or recovery in the wild, or destroy or adversely modify designated critical habitat. NOAA Fisheries has determined that when the effects of the proposed action addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, it is not likely to jeopardize the continued existence of listed salmonids, or destroy or adversely modify designated critical habitat.

These conclusions are based on the following considerations: (1) Placement of the cap will be completed between November 1 and February 28, which is within the preferred in-water work for the Oregon Slough; (2) sediment control measures are expected to minimize sediment transport and thus minimize turbidity increases within and downstream of the action area; (3) any turbidity increases which do occur are expected to be of short duration; (4) existing pilings will be removed; (5) little if any established riparian vegetation will be affected; (6) the contaminated materials will be isolated from the water column and benthic prey species; (7) despite a permanent alteration of about 1.06 acres of river bed habitat, this project is expected to provide a net benefit to listed species because of the improvements to water quality, and removal of the chemical exposure pathway for the benthic community; and (8) the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.9 Reinitiation of Consultation

This concludes formal consultation on these actions in accordance with 50 CFR 402.14(b)(1). Reinitiation of consultation is required: (1) If the amount or extent of incidental take is exceeded; (2) if the action is modified in a way that causes an effect on the listed species that was not previously considered in the biological assessment and this biological opinion; (3) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; (4) a new species is listed or critical habitat is designated that may be affected by the action; or (5) new critical habitat rulemaking results in the designation of critical habitat that may be affected by the action (50 CFR 402.16).

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the proposed action is reasonably certain to result in incidental take of listed species covered in this Opinion because of detrimental effects from in-water activities and increased turbidity in the action area along the Oregon Slough.

Handling of juvenile salmonids during the work isolation process may result in incidental take. NOAA Fisheries anticipates incidental take of up to 50 individuals as a result of the fish rescue, salvage and relocation activities and gravel and rock placement activities covered by this Opinion. Of these, three fish may die. The potential adverse effects of the other project

components on population levels are largely unquantifiable and NOAA Fisheries does not expect them to be measurable as long-term effects on habitat or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to the placement of the sediment, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take because of the increased turbidity and other habitat-related effects. The extent of authorized take is limited to the action area, and includes the streambed of the Oregon Slough, from 100 feet upstream of the cap boundary, downstream to the extent of visible turbidity resulting from construction activities, 300 feet downstream of the cap boundary.

2.2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize take of listed salmonid species resulting from the action covered by this Opinion. The COE shall include, as part of the section 404 permit, measures that will:

1. Minimize the likelihood of incidental take from in-water work associated with the removal of the timber pilings and placement of the sediment cap by applying permit conditions to avoid or minimize disturbance to riparian and aquatic systems.

2. Minimize the likelihood of incidental take by completing a comprehensive monitoring and reporting program to ensure this Opinion is meeting its objective of minimizing the likelihood of take from permitted activities.

2.2.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must require, as part of the section 404 permit, that the applicant and/or their contractors comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (piling removal and placement of the sediment cap), the COE shall ensure that:

    a. Project Design. The design of this project is reviewed to ensure that impacts to natural resources have been avoided, minimized and mitigated, and that the following overall project design conditions are met.
        i. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.
        ii. In-water work. All work which could potentially contribute sediment or toxicants to listed fish-bearing systems, will be completed within the ODFW approved in-water work period (November 1 - February 28);

(1) Work period extensions. Extensions of the in-water work period, including those for work outside the wetted perimeter of the stream but below the ordinary high water mark must be approved in writing by biologists from NOAA Fisheries.

iii. Pollution and erosion control plan. A pollution and erosion control plan (PECP) will be developed to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:

(1) Methods that will be used to prevent erosion and sedimentation associated with placement of the sediment cap, including the deployment and removal of the sediment curtains.

(2) A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

(3) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(4) The sediment curtains should be removed after the completion of all in-water work that has the potential to suspend sediments. The process for removal of the sediment curtains must be addressed in the pollution and erosion control plan, and may include the use of divers or people deployed in the water to aid in the removal of the curtains, sedimats, or other techniques to contain sediment that has been trapped in the curtains.

b. Pre-construction activities. Before significant alteration of the action area, the following actions will be accomplished.

i. Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation and other sensitive sites beyond the flagged boundary.

ii. The following erosion control materials are onsite.

(1) A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

(2) An oil-absorbing, floating boom is available on-site during all phases of construction whenever surface water is present.

iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

c. Heavy Equipment. Heavy equipment use will be restricted as follows.

i. When heavy equipment is required, the applicant will use equipment having the least impact (*e.g.*, minimally-sized, rubber-tired).

ii. Heavy equipment will be fueled, maintained and stored as follows.

(1) Place vehicle staging, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from the Oregon Slough.

(2) All vehicles operated within 150 feet of the Oregon Slough will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.

(3) When not in use, vehicles will be stored in the vehicle staging area.

d. Earthwork. Earthwork, including excavation, dredging, filling and compacting, is completed in the following manner:

i. Material removed during excavation will only be placed in locations where it cannot enter the Oregon Slough or other waterbodies.

ii. All exposed or disturbed areas will be stabilized to prevent erosion.

(1) Areas of bare soil within 150 feet of the Oregon Slough or other sensitive areas will be stabilized by native seeding,[1] mulching, and placement of erosion control blankets and mats, if applicable, quickly as reasonable after exposure, but within 7 days of exposure. Non-native sterile seed mix may be used the first year for temporary erosion control.

(2) All other areas will be stabilized quickly as reasonable, but within 14 days of exposure.

(3) Seeding outside of the growing season will not be considered adequate nor permanent stabilization.

iii. All erosion control devices will be inspected during construction to ensure that they are working adequately.

(1) Erosion control devices will be inspected daily during the rainy season and weekly during the dry season until the site is permanently stabilized.

(2) If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.

(3) Erosion control measures will be judged ineffective when turbidity plumes are evident in waters occupied by listed salmonids during any part of the year.

[1] By Executive Order 13112 (February 3, 1999), federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

iv. If soil erosion and sediment resulting from construction activities is not effectively controlled, the engineer will limit the amount of disturbed area to that which can be adequately controlled.

v. Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 5 inches (12 cm). Catch basins will be maintained so that no more than 6 inches (15 cm) of sediment depth accumulates within traps or sumps.

vi. Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters the Oregon Slough or other waterbody. Silt fences or other detention methods will be installed as close as reasonable to culvert outlets to reduce the amount of sediment entering aquatic systems.

d. Fish Salvage. The fish salvaging aspect of this project must be accomplished as follows:

i. After placement of the sediment curtain, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury to fish.

ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever appropriate, to prevent the added stress of an out-of-water transfer.

iv. Seined fish must be released as near as possible to capture sites.

v. The COE shall ensure that the transfer of any ESA-listed fish to third parties other than NOAA Fisheries personnel receives prior approval from NOAA Fisheries.

vi. The COE shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained prior to project seining activity.

vii. The COE must allow NOAA Fisheries or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the seining records and facilities.

viii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fishery biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

ix. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as described in the NOAA Fisheries electrofishing guidelines.

e. Removal of Timber Pilings. Remove old timber pilings within the cap footprint using a barge-mounted hydraulic cutting device or with a diver using barge-mounted hoists to extract the cut portions. Once loose, place the piling onto the barge or other appropriate dry storage site. Before cutting each piling, place a sand collar around the piling.

f. Placement of the Sediment Cap. Use a geotextile fabric to minimize the suspension of sediment. Place of gravel and rock with a barge-mounted clamshell bucket or equivalent, to provide a high degree of control for material placement.

g. Institutional Controls. Apply deed and property restrictions to the site to prevent damage to the cap and potential harm to listed species over the long term, and to ensure responsibility for monitoring and maintenance of the cap, physical barriers and signage.

2. To implement reasonable and prudent measure #2 (monitoring and reporting), the COE shall ensure that:

a. Monitoring. Within 30 days of completing the project, the COE will submit a monitoring report to NOAA Fisheries describing the COE's success meeting these terms and conditions. This report will consist of the following information.

i. Project identification.

(1) Starting and ending dates of work completed for this project.

(2) Name and address of the construction supervisor.

ii. Photographic documentation of environmental conditions at the project site before, during and after project completion. Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.

b. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the National Marine Fishery Service Law Enforcement Office, Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; telephone: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

c. Monitoring reports will be submitted to:

National Marine Fisheries Service
Oregon Habitat Branch
Attn: 2003/01434
525 NE Oregon Street
Portland, OR 97232

3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries shall provide conservation recommendations for any federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such

as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to *The Pacific Coast Groundfish Management Plan* (PFMC 1998a) and NOAA Fisheries' *Essential Fish Habitat for West Coast Groundfish Appendix* (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the *Coastal Pelagic Species Fishery Management Plan* (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Action

The proposed action is detailed above in section 1.2. This area has been designated as EFH for various life stages of chinook and coho salmon and starry flounder (*Platyichthys stellatus*).

3.4 Effects of Proposed Action

As described in detail in section 1.5, the proposed activities may result in detrimental short- and long-term adverse effects to a variety of habitat parameters. Placement of cap material could result in a temporary increase in turbidity, and a permanent change to the substrate of the Oregon Slough within the cap footprint.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect the EFH for Pacific salmon species and starry flounder.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the COE and all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.3 and 2.2.4, respectively, are applicable to EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.8 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) require the federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Birtwell, I. K., G. F. Hartman, B. Anderson, D. J. McLeay and J. G. Malick. 1984. A Brief Investigation of Arctic Grayling (*Thymallus arcticus*) and Aquatic Invertebrates in the Minto Creek Drainage, Mayo, Yukon Territory: An Area Subjected to Placer Mining. Canadian Technical Report of Fisheries and Aquatic Sciences 1287.

Burgner, R.L. 1991. Life history of sockeye salmon (*Oncorhynchus nerka*). Pages 1-117 *In:* C. Groot and L. Margolis (editors.). 1991. Pacific Salmon Life Histories. Vancouver, British Columbia. University of British Columbia Press.

Busby, P., S. Grabowski, R. Iwamoto, C. Mahnken, G. Matthews, M. Schiewe, T. Wainwright, R. Waples, J. Williams, C. Wingert and R. Reisenbichler. 1995. Review of the status of steelhead (*Oncorhynchus mykiss*) from Washington, Idaho, Oregon, and California under the U.S. Endangered Species Act. 102 p. plus 3 appendices.

Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-27, 261p.

Casillas, E., L. Crockett, Y. deReynier, J. Glock, M. Helvey, B. Meyer, C. Schmitt, M. Yoklavich, A. Bailey, B. Chao, B. Johnson and T. Pepperell. 1998. Essential Fish Habitat West Coast Groundfish Appendix. National Marine Fisheries Service Seattle, Washington. 778 p.

DeVore, P. W., L. T. Brooke and W. A. Swenson. 1980. The Effects of Red Clay Turbidity and Sedimentation on Aquatic Life In the Nemadji River System. Impact of Nonpoint Pollution Control on Western Lake Superior. S. C. Andrews, R. G. Christensen, and C. D. Wilson. Washington, D.C., U.S. Environmental Protection Agency. EPA Report 905/9-79-002-B.

Fulton, L.A. 1968. Spawning areas and abundance of chinook salmon, *Oncorhynchus tshawytscha*, in the Columbia River Basin–Past and present. U.S. Fish and Wildlife Service Spec. Sci. Rep.–Fish. 571, 26p.

Gregory, S.V., F.J. Swanson, W.A. McKee and K.W. Cummins. 1991. An ecosystem perspective of riparian zones: Focus on links between land and water. BioScience 41(8): 540-551.

Healey, M.C. 1991. Life history of chinook salmon (*Oncorhynchus tshawytscha*). Pages 311-393 *In:* Groot, C. and L. Margolis, (editors). Pacific Salmon Life Histories. Vancouver, British Columbia. University of British Columbia Press.

Irving, J.S. and T. Bjornn. 1991. A forecast of abundance of Snake River fall chinook salmon. Prepared for U.S. Fish and Wildlife Service. Unpublished MS. 55 p. Available from Idaho Cooperative Fishery Research Unit. University of Idaho, Moscow, ID.

Johnson, O.W., W.S. Grant, R.G. Cope, K. Neely, F.W. Waknitz and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-32, 280 p.

Lloyd, D. S. 1987. Turbidity as a water quality standard for salmonid Habitats in Alaska. North American Journal of Fisheries Management 7:34-45.

Lloyd, D. S., J. P. Koenings and J. D. LaPerriere. 1987. Effects of turbidity in fresh waters of Alaska. North American Journal of Fisheries Management 7:18-33.

Mallet, J. 1974. Inventory of salmon and steelhead resources, habitats, use and demands. Project F-58-R-1. Idaho Department of Fish and Game, Boise, Idaho.

Matthews, G.M. and R.S. Waples. 1991. Status review for Snake River spring and summer chinook salmon. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-F/NWC-200, 75 p.

McLeay, D. J., G. L. Ennis, I. K. Birtwell and G. F. Hartman. 1984. Effects On Arctic Grayling (*Thymallus arcticus*) of Prolonged Exposure to Yukon Placer Mining Sediment: A Laboratory Study. Canadian Technical Report of Fisheries and Aquatic Sciences 1241.

McLeay, D. J., I. K. Birtwell, G. F. Hartman and G. L. Ennis. 1987. Responses of Arctic grayling (*Thymallus arcticus*) to acute and prolonged exposure to Yukon placer mining sediment. Canadian Journal of Fisheries and Aquatic Sciences 44: 658-673.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-NWFSC-35, 443 p.

Neave, F. 1961. Pacific salmon: Ocean stocks and fishery developments. Proceedings of the 9th Pacific Science Congress. 1957(10):59-62.

NMFS (National Marine Fisheries Service). 1995. Proposed recovery plan for Snake River Salmon. 364 pages plus appendices. Available from NMFS, 525 NE Oregon Street, Portland, Oregon 97232.

NMFS (National Marine Fisheries Service). 2002. Memorandum for Frank L. Cassidy, Jr. (Northwest Power Planning Council) from Bob Lohn (NMFS), April 2002. Available at http://www.nwr.noaa.gov/occd/InterimTargets.pdf.

NOAA Fisheries (National Marine Fisheries Service). 1999. The Habitat Approach: Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids. Guidance memorandum from Assistant Regional Administrators for Habitat Conservation and Protected Resources to Staff. 3 pages. August (Available @ www.nwr.noaa.gov, under Habitat Conservation Division, Habitat Guidance Documents).

NOAA Fisheries (*in review*). 2003. Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead. 142 pages. February. NOAA Fisheries, 525 NE Oregon Street, Suite 500, Portland, Oregon 97232-2737. (Available @ www.nwfsc.noaa.gov/)

ODEQ. 1998. Columbia Slough Total Maximum Daily Loads for Chlorphyll a, Dissolved Oxygen, pH, Phosphorus, Bacteria, DDE/DDT, PCBs, PB, Dieldrin and 2,3,7,8-TCDD. Oregon Department of Environmental Quality, September 1998. Website: http://www.deq.state.or.us/wq/TMDLs/ColSlgh/ColSloughTMDL.pdf

PFMC (Pacific Fishery Management Council), 1998a. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. October 1998.

PFMC (Pacific Fishery Management Council), 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. Portland, Oregon.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Salo, E.O. 1991. Life history of chum salmon (*Oncorhynchus keta*). Pages 231-309 Groot, C. and L. Margolis, (editors). Pacific Salmon Life Histories. Vancouver, British Columbia. University of British Columbia Press.

Scannell, P.O. 1988. Effects of Elevated Sediment Levels from Placer Mining on Survival and Behavior of Immature Arctic Grayling. Alaska Cooperative Fishery Unit, University of Alaska. Unit Contribution 27.

Servizi, J. A. and D.W. Martens. 1991. Effects of temperature, season, and fish size on acute lethality of suspended sediments to coho salmon. Canadian Journal of Fisheries and Aquatic Sciences 48:493-497.

Sigler, J. W., T. C. Bjornn and F. H. Everest. 1984. Effects of chronic turbidity on density and growth of steelhead and coho salmon. Transactions of the American Fisheries Society 113: 142-150. 1984.

Waples, R.S., O.W. Johnson and R.P. Jones, Jr. 1991a. Status review for Snake River sockeye salmon. U.S. Dept. Commer., NOAA Tech. Memo. NMFS F/NWC-195. 23 p.

Waples, R.S., R.P. Jones, Jr., B.R. Beckman and G.A. Swan. 1991b. Status review for Snake River fall chinook salmon. U.S. Dept. Commer., NOAA Tech. Memo. NMFS F/NWC-201. 73 p.